

A Novel, Ultra-Light, Heat Rejection System for Nuclear Power Generation, Phase II

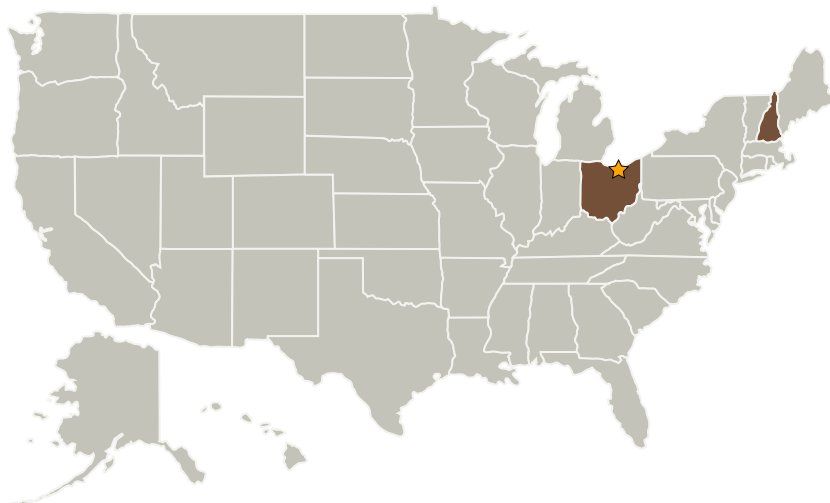
Completed Technology Project (2007 - 2009)



Project Introduction

For lunar-based fission power systems that will support In-Situ Resource Utilization (ISRU) or Mars robotic and manned missions, power requirements may vary from 10s to 100s of kWe to support initial human missions and longer term lunar bases. Due to the large amounts of waste heat generated by these systems, a key consideration is the development of lightweight, highly efficient heat rejection systems (HRS) that can operate at elevated temperatures (~550 K). Our innovation is the integration of an ultra-light radiator panel with a lightweight titanium heat pipe. Our approach will reduce the total mass by 32% compared to our baseline design. In addition, our innovation will greatly surpass the performance of carbon-composite systems under consideration and represents a lower risk approach to achieve a practical HRS. In Phase I, we demonstrated the feasibility by fabricating, demonstrating, and delivering a proof-of-concept panel. During Phase II, we will fabricate, test, and deliver a full-scale prototype.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Creare LLC	Supporting Organization	Industry	Hanover, New Hampshire



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

New Hampshire

Ohio

Project Transitions



December 2007: Project Start



December 2009: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.3 Heat Rejection and Storage